Part 1

Zeros of Functions

ZoF1.tex

Exercise 1 *Feel free to use Desmos or another graphing calculator for the following problems.*

(a) *Let f be a function defined by $f(x) = 23$.*

The function f has $\boxed{0}$ *zero(s).*

(b) *Let g be a function defined by $g(x) = x^2 + 2x - 2$.*

The function g has $\boxed{2}$ *zero(s).*

(c) *Let h be a function defined by $h(x) = \dfrac{x^2 - 9}{x - 3}$.*

The function g has $\boxed{1}$ *zero(s).*

ZoF2.tex

Exercise 2 *For each function, select all zeros of the given function.*

(a) *Let f be a function defined by $f(x) = 3x - 5$. Select all zeros of f.*

Select All Correct Answers:

(i) $\dfrac{1}{3}$

(ii) $\dfrac{3}{5}$

(iii) 1

(iv) $\dfrac{5}{3}$ ✓

(b) *Let g be a function defined by $g(x) = 5 - x$. Select all zeros of g.*

Select All Correct Answers:

(i) 1

(ii) 4

(iii) 5 ✓

(iv) -5

(c) *Let h be a function defined by $h(x) = \dfrac{2 - x}{3}$. Select all zeros of h.*

Select All Correct Answers:

(i) $\frac{2}{3}$
(ii) $\frac{3}{2}$
(iii) 3
(iv) 2 ✓

`ZoF3.tex`

Exercise 3 *For each function, select all zeros of the given function. If there are none, do not select any options.*

(a) *Let f be a function defined by $f(x) = |x + 7|$. Select all zeros of f.*

Select All Correct Answers:

(i) 0
(ii) 7
(iii) -7 ✓
(iv) -14

(b) *Let g be a function defined by $g(x) = |x| - 7$. Select all zeros of g.*

Select All Correct Answers:

(i) 0
(ii) 7 ✓
(iii) -7 ✓
(iv) -14

(c) *Let h be a function defined by $h(x) = \frac{1}{4}|x - 6| - 3$. Select all zeros of h.*

Select All Correct Answers:

(i) -6 ✓
(ii) 0
(iii) 6
(iv) 12
(v) 18 ✓

(d) *Let j be a function defined by $j(x) = x - |x| + 22$. Select all zeros of j.*

Select All Correct Answers:

(i) -22
(ii) -11 ✓
(iii) 0
(iv) 11
(v) 22

`ZoF4.tex`

Exercise 4 *For each function, select all zeros of the given function. If there are none, do not select any options.*

(a) *Let f be a function defined by $f(x) = x^2 + 9$. Select all zeros of f.*

Select All Correct Answers:

(i) 3
(ii) -3
(iii) 0
(iv) 9

(b) *Let g be a function defined by $g(x) = -(x - 5)^2$. Select all zeros of g.*

Select All Correct Answers:

(i) 0
(ii) -5
(iii) 5 ✓
(iv) 2

(c) *Let h be a function defined by $h(x) = x^2 - 3x - 4$. Select all zeros of h.*

Select All Correct Answers:

(i) -1 ✓
(ii) 0
(iii) 2
(iv) 3

(v) $\dfrac{4}{3}$

(vi) 4 ✓

(d) *Let j be a function defined by $j(x) = -4(x+3)^2 + 20$. Select all zeros of j.*

Select All Correct Answers:

(i) $-3 - \sqrt{5}$ ✓

(ii) $3 - \sqrt{5}$

(iii) $-3 + \sqrt{5}$ ✓

(iv) $3 + \sqrt{5}$

`ZoF5.tex`

Exercise 5 *The equation $12x - 3 = -5 - x$ can be rewritten as $f(x) = 0$ for some function f. In this case,*

$$f(x) = \boxed{13}x + 2.$$

The zero of f is $\boxed{-\dfrac{2}{13}}$.

`ZoF6.tex`

Exercise 6 *The equation $2x^2 - 3x - 2 = 5 - 3x$ can be rewritten as $f(x) = 0$ for some function f. In this case*

$$f(x) = \boxed{2}x^2 - 7.$$

Select the zeros of f below.

Select All Correct Answers:

(a) $\sqrt{\dfrac{7}{2}}$ ✓

(b) $-\sqrt{\dfrac{7}{2}}$ ✓

(c) $\sqrt{\frac{2}{7}}$

(d) 1.9

(e) 1.87

`ZoF7.tex`

Exercise 7 *In each part, select whether the term that best describes the prompt.*

(a) $27yz\sqrt{\ln(x)}$

Multiple Choice:

(i) *Expression* ✓
(ii) *Equation*

(b) $\sin(\cos(xy))$

Multiple Choice:

(i) *Expression* ✓
(ii) *Equation*

(c) $a^2 + b^2 = c^2$

Multiple Choice:

(i) *Expression*
(ii) *Equation* ✓

(d) $\cos(w) + 51e^x = 0$

Multiple Choice:

(i) *Expression*
(ii) *Equation* ✓
